How I Do It...

TEP and TAPP Inguinal Hernia Repairs

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Introduction

• History of hernia surgery goes back to ancient Egypt

• Bassini made the first biggest contribution to open inguinal hernia repair (emphasis on repair of the posterior wall)

• First laparoscopic inguinal hernia repair performed by Ger in 1970s (published in 1982)

• Schultz described the TAPP repair in 1990

• McKernon and Laws described the TEP repair in 1993
Introduction

• Inguinal hernias are the second common procedure performed by general surgeons in the U.S. (>600,000 cases per year)

• Most are still performed OPEN

• 25% performed via MIS approach (lap / robotic)
Terminology

- “Groin hernia” encompasses
  - inguinal hernia – direct and indirect
  - femoral hernia
  - obturator hernia
  - avoid using “groin hernia” if possible

- “Inguinal” vs “scrotal” hernia

- Size of hernias
  - “small” – palpable, but not visible
  - “medium” – visible (a small gumball)
  - “large” – visible and large enough that you have to use identifiable objects
TAPP vs TEP

**TAPP**

- **Advantages**
  - larger working space
  - allows for immediate identification of groin anatomy
  - can perform diagnostic laparoscopy
  - can perform concurrent laparoscopic procedure (i.e. adhesiolysis, cholecystectomy)

- **Disadvantages**
  - increased risk of injury to visceral organs
  - complications associated with improper closure of the peritoneum (i.e. fistula, bowel obstruction)
TEP vs TEP CONT

**TEP**

- **Advantages**
  - minimizes all complications associated with entering the peritoneal cavity
  - quicker preperitoneal dissection

- **Disadvantages**
  - small working space (esp low arcuate line, peritoneal rent, etc)
  - increased cost from using commercially-available balloon dissector/port system
  - not feasible in patients with prior preperitoneal dissection/surgery
TAPP vs TEP CONT

• Advantages of TEP/TAPP over OPEN techniques
  - less risk of CHRONIC groin pain
  - can repair bilateral inguinal hernias easier
  - requires less help

• TAPP/TEP approach does **NOT** confer following advantages over open approach:
  - faster surgery
  - less ACUTE pain
  - less wound complication
  - faster recovery from surgery
TAPP vs TEP CONT

- Based on a meta-analysis of the RCTs, the recurrence rates are equivalent, but the learning curve may be steeper for the TEP repair.\(^1\)

- TEP repair *was* more popular because it avoid entering the peritoneal cavity.

- But recently, TAPP repair has become more popular due to the robot.
TAPP vs TEP CONT

• If you’re going to learn ONLY one technique, then learn TAPP.

• But if you prefer TEP, you also need to learn how to TAPP as well.
Sites of groin hernias

- Median umbilical fold
- Medial umbilical fold
- Lateral umbilical fold (inferior epigastric vessels)
- Right direct inguinal hernia
- Deep inguinal ring and indirect inguinal hernia
- Line of peritoneal incision

- Bladder
- Vas deferens
- Spermatic vessels
- Iliac vessels
- Left ureter
- Sigmoid colon
INITIAL VIEW (after balloon dissection)
OBTURATOR NERVE and ARTERY (through foramen)
OBTURATOR NERVE and ARTERY (through foramen)
“Triangle of Doom”
“Triangle of Pain”

- Inferior epigastric vessels
- Internal inguinal ring
- Lateral femoral cutaneous nerve
- Electrical hazard zone
- Genitofemoral nerve
- Spermatic vessels
- Musculoaponeurotic arch of transverse abdominus
- Lateral border of rectus abdominus
- Iliopubic tract
- Pubis
- Cooper’s ligament
- Vas deferens

“Triangle of doom”
Locations of nerves that may be injured during laparoscopic inguinal hernia repair
LATERAL FEMORAL CUTANEOUS NERVES
Corona Mortis
NAVEL anatomy of right groin area
LATERAL TRIANGLE and FEMORAL SPACE
Positioning and ports
OR positioning

- Ventilator
- Anesthesiologist
- First assistant
- Nurse
- Operating surgeon
- Mayo stand
- Instrument table
- Monitor, light source, insufflator
TAPP ports
TAPP technique
Diagnostic laparoscopy

- INDIRECT Hernia
- Lateral umbilical ligament
- Medial umbilical ligament
1 DIAGNOSTIC LAPAROSCOPY
TAPP (development of the peritoneal flap)
3 DEVELOPMENT OF PERITONEAL FLAP
TAPP (closure of peritoneal flap)
RE-PERITONEALIZATION USING UNIVERSAL 65 STAPLER™
RE-PERITONEALIZATION USING ABSORATACK™
RE-PERITONEALIZATION USING FREE SUTURE (V-LOC™)
TEP technique
TEP (initial incision)
TEP (Use of “S” retractor s for exposure)
TEP (development of pre-peritoneal space)
TEP (Placement of the balloon dissector)
1 BALLOON DISSECTION
VIEW OF ARCUATE LINE
JUST AN ORDINARY DAY UNTIL...
TEP (additional port placement)
PLACEMENT OF PORTS AND CHOICE OF DISSECTOR
The actual dissection

TAPP/TEP technique
STEP 1: (GENERAL) LATERAL DISSECTION
STEP 2: (GENERAL) MEDIAL DISSECTION
STEP 3: (GENERAL) POSTERIOR DISSECTION
STEP 4: DISSECTING OUT INGUINAL CANAL
STEP 5: SEPARATING HERNIA SAC FROM CORD CONTENTS
STEP 6: “FINISHING TOUCHES” FOR MESH PLACEMENT
Unplanned vasectomy is not as bad as unplanned orchiectomy!!!
Mesh placement

TAPP/TEP technique
IPOM technique
“Keyhole” technique

And the good news is Mr. Watkins, your keyhole surgery was a complete success.
“Onlay” technique
6 x 4 in (10 x 15 cm) mesh
MESH PLACEMENT (10 x 15 cm Parietene™)
Covidien Parietex™
Anatomic Mesh

[Image of mesh and anatomical diagram]
TACKING ANATOMIC MESH (WITH RELIATACK™)
FOLDING 6 X 4” PROGRIP™ FOR PLACEMENT
9 MESH PLACEMENT (6 X 4” PROGRIP™)
9 MESH PLACEMENT (6 X 4” PROGRIP™) during TAPP (LEFT)
9 MESH PLACEMENT (ANATOMIC PROGRIP™)
OPEN technique
My preference

• I still perform a lot of open inguinal hernia repairs

• TISSUE REPAIR (Bassini, McVay and Shouldice)

• Keep the “love” alive, especially for the residents

• Faster for patients with larger hernias (large hernia = more difficult dissection)

• More ideal for larger hernias (actually close the defect instead of bridging the defect)
BUT THAT IS ANOTHER STORY...